CHAPTER 2. EXISTING PROTOCOLS AND GUIDELINES

Prior to discussing the issues involved in the development of MERV protocols and guidelines, we briefly review protocols and guidelines that already exist. We divide them into two categories: (1) protocols and guidelines related to greenhouse gases and (2) protocols and guidelines not related to greenhouse gases. In this paper, protocols typically refer to project-specific methodologies and MERV requirements that need to be followed, while guidelines are more general and strict adherence to them is not expected. We briefly describe the protocols and guidelines in this section and later use examples from them to illustrate key points in the paper.

2.1. GHG-Related Protocols and Guidelines

We are aware of seven protocols and guidelines related to greenhouse gases:

1. U.S. Initiative on Joint Implementation's (USIJI) project proposal guidelines
2. Subsidiary Body for Scientific and Technological Advice's (SBSTA) uniform reporting format guidelines
3. World Business Council for Sustainable Development's (WBCSD) proposal guidelines
4. World Bank's monitoring and evaluation guidelines
5. U.S. Department of Energy's (DOE) voluntary reporting guidelines for greenhouse gases
6. Winrock 's carbon monitoring guidelines
7. SGS Forestry's carbon offset verification guidelines

The USIJI, SBSTA, and WBCSD guidelines provide general guidance for preparing project proposals. The World Bank and DOE guidelines contain general methodologies for calculating GHG emissions. And the Winrock and SGS guidelines provide specific methodologies and guidance for forestry-related projects. At the end of this paper, we review how these guidelines address the MERV issues discussed in this paper.

2.1.1. USIJI's project proposal guidelines

The U.S. Climate Change Action Plan, announced on Oct. 19, 1993, set forth a series of measures designed to return U.S. greenhouse gas emissions to 1990 levels by the year 2000 largely through voluntary domestic actions. Recognizing the enormous potential for cost-effective GHG emission reductions in other countries, the Plan provided for a pilot program — the U.S. Initiative on Joint Implementation (USIJI) — to help establish an empirical basis for considering approaches to joint implementation internationally and thus help realize the potential of joint implementation both to combat the threat of global climate change and to promote sustainable development.[1]

USIJI is the first and currently most developed joint implementation pilot program worldwide. In 1996, the USIJI prepared project proposal guidelines for organizations seeking funding from investors to reduce GHG emissions (USIJI 1996). By complying with the guidelines and obtaining approval from the U.S. government and the government of the host country, project proponents receive institutional credibility (e.g., by receiving government recognition), technical credibility (e.g., by meeting USIJI criteria and clearly documenting emissions reductions), and public recognition (e.g., by receiving a certificate at an awards ceremony) (personal communication from Jackie Krieger, USIJI, Sept. 26, 1997). In addition, they receive technical assistance in interpreting the USIJI criteria, calculating and documenting reference- and project-case GHG emissions, working with the governments of the host countries, and reporting to the UNFCCC.

The guidelines request information on the proposed project, including the identification of all GHG sources and sinks included in the emissions baseline as well as those affected by the proposed project, and net impacts (see Section 3.3.2). The guidelines also ask for information on the estimates of GHG emissions and sequestration, including methodologies, type of data used, calculations, assumptions, references and key uncertainties affecting the emissions estimates. The estimates include the baseline estimate of emissions or sequestration of GHG without measures and the estimate of emissions or sequestration of GHG with measures.

The guidelines require applicants to describe the process used to monitor GHG reductions, including the parties responsible for monitoring GHG emissions and reductions, the specific data that will be collected in monitoring GHG reductions, and data collection procedures (sampling methodologies, emissions monitoring equipment, and estimation methodologies). Furthermore, the guidelines ask the applicant to describe the provisions in the project for external verification of GHG emission reductions

[1] Department of State Public Notice 1918 (58 FR 66057-66059, Dec. 17, 1993) set forth the draft Groundrules for the U.S. Initiative on Joint Implementation to provide for the operation of a pilot program. Following the public comment period, the revised final Groundrules were published in Department of State Public Notice 2015 (59 FR 28442-28446, June 1, 1994).

or sequestration. USIJI requires participants to allow external verification of GHG emissions reductions or sequestration by an Evaluation Panel, its designee, or a party(ies) named at a later date subject to approval by the Evaluation Panel. Such verification may include third-party inspection of documentation of emissions reductions, or site visits to the project.

In addition to the guidelines themselves, one of the key features of the USIJI is the Evaluation Panel, consisting of members from: the U.S. Department of Energy; the U.S. Environmental Protection Agency; the State Department; the Agency for International Development; the Departments of Agriculture, Commerce, Interior, and Treasury; and others as necessary. The Evaluation Panel has several responsibilities including reviewing, evaluating, and accepting project submissions that meet program criteria.

2.1.2. SBSTA's Uniform Reporting Format guidelines

The Framework Convention on Climate Change's (FCCC) Subsidiary Body for Scientific and Technological Advice (SBSTA) recently developed a Uniform Reporting Format (URF) for activities implemented jointly under a pilot program (Appendix B); the format was approved by the SBSTA as part of the implementation of the FCCC (SBSTA 1997).[1] The project proposers need to quantify the projected emission reductions for their project baseline scenario, project activity scenario, and cumulative effects for carbon dioxide, methane, nitrous oxide, and other greenhouse gases. One of the unique features of the URF is the section on benefits (environmental, social/cultural, and economic): quantitative information is requested, but if not available, qualitative information should be given. Project proposers need to describe how their project is compatible with, and supportive of, national economic development and socioeconomic and environmental priorities and strategies.

Furthermore, the URF requests information on the "practical experience gained or technical difficulties, effects, impacts or other obstacles encountered" (either quantitatively or qualitatively). The impacts include environmental, social/cultural, or economic impacts. In addition to the United States, other countries that have developed proposal guidelines based on the URF include: Australia, Costa Rica, Japan, Norway, Poland, Sweden, and Switzerland (Appendix C).

[1] The SBSTA is one of the most prominent organizations involved in the discussion of joint implementation issues, including MERV issues.

2.1.3. WBCSD's project proposal guidelines

The World Business Council for Sustainable Development (WBCSD) has prepared guidelines, similar to the URF guidelines, for detailed proposals in order to attract investors to invest in climate change mitigation projects (Appendix D; for more information on the WBCSD, see their home page on the World Wide Web: http://www.wbcsd.climatechange.com/home.html). One section of the guidelines covers monitoring and reporting, such as a discussion of the parties responsible for the monitoring, the specific data that will be used to monitor GHG reductions, a schedule for monitoring, and data collection procedures. The data collection procedures section asks for a description of the sampling methodologies, emissions monitoring equipment (where relevant), use of remote sensing (where relevant), and methodologies for estimating emissions reductions from the raw data. The guidelines contain a brief section on external verification: project proposers need to name the organization(s) responsible for conducting external verification of project activities and records, the frequency of the verification, and what aspects of the project will be verified.

One of the unique features of the WBCSD guidelines is a requirement for a "contingency plan" that identifies potential project risks and a discussion of the contingencies provided within the project estimates to manage the risks. Similarly, in another part of the guidelines, proposers need to identify and discuss the key uncertainties affecting all emissions estimates. Proposers also have to identify any potential source of leakage and describe the steps that will be taken to reduce the risks of potential leakage, or to ensure that the benefits of the proposed project would not be lost or reversed in the future due to leakage.

2.1.4. World Bank's monitoring and evaluation guidelines

The World Bank prepared monitoring and evaluation guidelines for the Global Environment Facility (GEF), a multilateral funding program created to support projects that yield global environmental benefits but would not otherwise be implemented because of inadequate economic or financial returns to project investors (World Bank 1994a). The GEF supports four types of projects: biodiversity preservation, pollution reduction of international waters, GHG emission reduction and, to a limited extent, the control of ozone-depleting substances.[1] This document is written for the consultants who will be engaged to conduct monitoring and evaluation tasks under GEF-earmarked funding.

[1] The control of ozone-depleting substances such as chlorofluorocarbons (CFCs) is primarily addressed under a separate multilateral program, the Montreal Protocol.

The monitoring and evaluation framework presented in this report differentiates projects according to the underlying physical GHG abatement processes:

a. *Biomass production*: stores (or sequesters) carbon in the form of the complex sugars that compose biomass;

b. *Fuel substitution*: replaces one type of fuel with another that produces less net GHG emissions upon combustion or transformation;

c. *Energy conservation*: reduces the amount of carbon fuel-derived energy that must be generated, transmitted or consumed to provide a given level of end-use service; and

d. *Direct capture* of greenhouse gases, followed by the storage or use of these gases.

The guidelines address both the institutional and technical dimensions of evaluation for GHG abatement projects and are referenced later in this report.

The World Bank has also developed a new analytical tool, called global overlays, that integrates GHG externalities into the Bank's economic and sector work (World Bank 1997b). These guidelines were prepared within the context of the FCCC and were developed for the energy and forestry sectors. The guidelines describe the steps involved in (1) estimating a baseline emissions inventory, (2) screening a broad range of GHG mitigation options, and (3) developing a mitigation scenario. While not targeted to project monitoring and evaluation, some of the basic concepts presented in this report may be useful for MERV activities.

2.1.5. DOE's voluntary reporting of greenhouse gases

The U.S. Department of Energy (DOE) prepared guidelines and forms for the voluntary reporting of greenhouse gases (DOE 1994a and 1994b). The guidelines and forms can be used by corporations, government agencies, households and voluntary organizations to report to the DOE's Energy Information Administration on actions taken that have reduced or avoided emissions of greenhouse gases. The documents offer guidance on recording historic and current GHG emissions, emissions reductions, and carbon sequestration. There is also guidance on such issues as joint reporting (if two or more organizations are responsible for achievements), third-party reporting (e.g., through a trade association), international projects, confidentiality, certification, and other elements of the reporting process.

The supporting documents (DOE 1994b) contain limited examples of project analysis for the following sectors: electricity supply, residential and commercial buildings, industrial, transportation, forestry, and agriculture. Each volume includes appendices that provide conversion tables and default emission

factors (for various fuels and for electricity on a state-by-state basis), as well as a list of greenhouse gases for which the Intergovernmental Panel on Climate Change has developed Global Warming Potentials (an index of the relative effects on climate of different gases).[1]

Emissions information could include data on the entire organization and all its greenhouse gas activities, including historic baseline emissions data for 1987 through 1990 (the "baseline period"), and annual emissions for subsequent years. The types of greenhouse gases and other radiatively enhancing gases are described in Section 3.2.1. Comprehensive information about emissions reduction projects could include both emissions reductions and carbon sequestration projects, emissions factors used to determine reductions, assumptions about the project, and data sources. Both direct and indirect emissions can be reported: direct emissions result directly from fuel combustion or other processes that release greenhouse gases on-site, while indirect emissions occur when activities cause emissions to be generated elsewhere. As an example (from this report), a manufacturer would report as direct emissions the carbon dioxide emitted from the stack of its assembly plant. The same manufacturer could report indirect emissions from the electricity used to light that assembly plant, since the electricity use causes emissions to be generated by an electric utility.

2.1.6. Winrock's carbon monitoring guidelines

The Winrock International Institute for Agricultural Development published a guide to monitoring carbon sequestration in forestry and agroforestry projects (MacDicken 1996).[2] The guide describes a system of cost-effective methods for monitoring and verifying, on a commercial basis, the accumulation of carbon in forest plantations, managed natural forests and agroforestry land uses. This system is based on accepted principles and practices of forest inventory, soil science and ecological surveys. Winrock's monitoring system assesses changes in four main carbon pools: above-ground biomass, below-ground biomass, soils, and standing litter crop. It aims to assess the net difference in each pool for project and non-project (or pre-project) areas over a specified period of time.

[1] The Intergovernmental Panel on Climate Change (IPCC) has compiled a list of emission factors, too (IPCC 1995).

[2] WIIAD is a nonprofit organization whose mission is to work with people to build a better world by increasing agricultural productivity and rural employment while protecting the environment. Winrock's Forest Carbon Monitoring Program is supported by the US AID Center for Environment, Winrock International and a wide range of private, nongovernment, and government sponsors.

The Winrock monitoring system covers the following components:

1. Determination of a baseline on pre-project carbon pools in biomass, soils, and standing litter crop.

2. Establishment of permanent sample plots for periodic comparative measurement of changes in carbon pools.

3. Plotless vegetation survey methods to measure carbon stored in nonproject areas or areas with sparse vegetation.

4. Calculation of the net differences in carbon accumulated in project and nonproject land uses.

5. Use of satellite images as gauges of land-use changes, and as base maps for a microcomputer-based geographic information system.

6. Software for calculating minimum sample size, assigning sample unit locations, determining the minimum spacing for plots, and optimizing site-specific monitoring plans.

7. Computer modeling of changes in carbon storage for periods between field measurements.

8. A database of biomass partitioning (roots, wood and foliage) for selected tree species.

The system has been field tested on six sites located in Brazil, Belize, the Philippines and the United States and is now in use, or planned for use, in over 950,000 hectares in six countries (MacDicken 1997).

2.1.7. SGS Forestry's Carbon Offset Verification Service

SGS Forestry's Carbon Offset Verification Service is the first international third-party verification service of forestry-based carbon offset projects (EcoSecurities 1997; Moura Costa et al. 1996).[1] The service consists of a formal analysis of project concept and design, and an independent quantification and verification of projected and achieved carbon savings derived from the project. SGS Forestry's methodology covers the following components: (1) suitability assessment of project design, to determine whether the project fulfills SGS Forestry's carbon offset project eligibility criteria; (2) assessment of the project's scientific methodology, focusing on data quality and statistical analysis; (3) verification of projections of net carbon flows derived from the project by quantifying carbon flows of with- and

[1] Carbon offset is the result of any action specifically taken to remove from, or prevent the release of, carbon dioxide into the atmosphere in order to balance emissions taking place elsewhere. Carbon offsets are synonymous with GHG reductions (i.e., GHG emission reductions and carbon sequestration).

without-project (baseline) scenarios, using SGS Forestry's Carbon Quantification Model; and (4) a surveillance program for assessment of project development and verification of achieved offsets.

The SGS service is designed to provide a greater confidence for carbon offset projects, regulation and transactions, by being an impartial third-party with a uniform evaluation methodology. SGS Forestry is not a judge in accepting or rejecting the validity of particular projects. SGS defers the ultimate judgment regarding the acceptability of particular projects and transactions to regulators in the countries involved.

SGS Forestry's carbon offset project eligibility criteria include the following: (1) acceptability (at national and international levels); (2) additionality (e.g., emissions and financing); (3) externalities (including leakage and social and environmental impacts); and (4) capacity (e.g., management, financial, infrastructure, technology and verification expertise and resources).

SGS Forestry's Carbon Quantification Model is used to assist the verification of the initial projections of carbon flows. The model is based on the following carbon pools and their flows: (1) trees (above and below ground components); (2) other vegetation; (3) necromass (fine and coarse litter, dead trees, etc.); (4) soil carbon; and (5) wood products (including their primary and secondary utilization and conversion rates).

SGS Forestry's surveillance program consists of periodic verification of carbon achievements, concentrating on field implementation and field data gathered by the project's internal monitoring program, such as field inspections, verification of field books, calculations, field audits, reports, etc. Based on the results of assessments carried out during the surveillance visits, SGS Forestry will issue certificates stating the amount of carbon fixed by the project up to the date of the most recent assessment.

SGS Forestry is now adapting its methodology to fulfill the characteristics of Costa Rica's national carbon acquisition program. This program, coordinated by the Costa Rican Office for Joint Implementation, will attract part of its financing through the international sale of Certified Tradable Offsets.

2.2. Non-GHG-Related Protocols and Guidelines

We are aware of four protocols and guidelines that are not directly related to greenhouse gases but may serve as examples of the way the protocols and guidelines could be developed:

1. DOE's energy measurement and verification protocols
2. EPA's acid rain monitoring protocols
3. EPA's Conservation Verification Protocols
4. Dutch reporting and monitoring guidelines

DOE's energy measurement and verification protocols contain recent, international guidelines being used for evaluating energy-efficiency projects and provides a flexible approach for addressing the monitoring and verification needs of different stakeholders and projects. In contrast to the other protocols and guidelines in this report, EPA's acid rain monitoring protocols are involuntary and have been used for years in monitoring energy projects for conformance with national air quality legislation (the Clean Air Act). EPA's conservation and verification protocols have been used by several utilities in obtaining air quality credits for their energy-efficiency projects. The Dutch reporting and monitoring guidelines are being used by Dutch industries for their energy-efficiency projects as part of their voluntary agreements with the Dutch government.

2.2.1. DOE's energy measurement and verification protocols

The U.S. Department of Energy (DOE) prepared the International Performance Measurement and Verification Protocol (IPMVP, formerly called the North American Energy Measurement and Verification Protocol) as a consensus document for measuring and verifying energy savings from energy-efficiency projects (Kats et al. 1996 and 1997; Kromer and Schiller 1996; U.S. Department of Energy 1996b).[1] A key element of the IPMVP is the definition of two measurement and verification (M&V) components: (1) verifying proper installation and the measure's potential to generate savings, also stated as confirming that (a) the baseline conditions were accurately defined and (b) the proper equipment/systems were installed, were performing to specification, and had the potential to generate the predicted savings; and (2) measuring (or estimating) actual savings. The general approach to

[1] The protocol can be obtained by calling the Federal Energy Management Program (FEMP) at 800-566-2877, or can be downloaded via the World Wide Web through the U.S. Department of Energy's home page: http://www.eren.doe.gov. The protocol is listed under the topic: "Building systems and community programs."

verifying baseline and post-installation conditions involves inspections, spot measurement tests, or commissioning activities.[1]

The IPMVP was built around a common structure of three M&V options (Options A, B, and C). These three options were based on the two components to M&V defined above. The purpose of providing several M&V options is to allow the user flexibility in the cost and method of assessing savings. A particular option is chosen based on the expectations for risk and risk sharing between the buyer and seller and onsite and energy-efficiency project specific features. The options differ in their approach to the level and duration of the verification measurements. None of the options are necessarily more expensive or more accurate than the others. Each has advantages and disadvantages based on site specific factors and the needs and expectations of the customer.

1. The first option, A, focuses at the system level and uses short-term measurements for verifying actual achieved energy savings of end-use technologies during the term of the contract. This enables the contracting parties to confirm that the proper equipment components or systems were installed and that they have the potential to generate the predicted savings. This option is recommended for projects where a significant portion of the associated uncertainty is in verifying the performance of the energy efficiency measure (e.g., equipment quantities and ratings such as lamp wattages, motor kW, or boiler efficiency).

2. The second option, B, focuses at the system level, but uses continuous or regular interval measurements. This provides the additional capability to determine an energy and costs savings value using end-use technologies data taken throughout the term of the contract, thereby accounting for operating variations.

3. The third option, C, uses measurements taken at the whole building or whole facility level, and uses continuous or regular interval measurements for verifying actual energy savings achieved facility-wide during the term of the contract. It addresses aggregate, coincident demand and energy savings from multiple resources at a single site. This provides for the measurement and verification of the impact of energy efficiency measures that are not directly measurable, such as increasing insulation or installing low-e windows.

The first version of the IPMVP was published in February 1996 and updates are planned for 1997 and beyond. The IPMVP has been adopted for use by four states (California, Florida, Iowa, and New York) and is being applied in the federal sector in Mexico. The IPMVP is being translated into seven languages (Czech, French, Hungarian, Polish, Portuguese, Russian, and Spanish) for implementation internationally (Kats et al. 1996 and 1997). The World Bank has adopted IPMVP for a $300 million energy efficiency loan to Russia — the largest efficiency loan ever. U.S. DOE is working with The World Bank and the U.S. Agency for International Development to use the IPMVP to develop other large-scale

[1] Commissioning is the process of documenting and verifying the performance of energy systems so that the systems operate in conformity with the design intent.

efficiency loans. In 1997, the protocol will be extended to include water efficiency (as well as energy efficiency), new buildings (as well as existing buildings), and indoor air quality issues.

2.2.2. EPA's Acid Rain monitoring forms and instructions

When the U.S. Clear Air Act was re-authorized in 1990, it included a program to control acid rain (Palmisano 1996). Title IV of the 1990 Act limits electric utilities' emissions of SO_2 and NO_x. Title IV created a regulatory regime to reduce the costs of meeting these emissions limits by allowing utilities to choose cost-effective pollution controls. Under Title IV, the U.S. Congress combined emissions trading concepts with strict monitoring requirements to ensure that new SO_2 emissions limits will be met.

To assure the public of the integrity of the system, power plants must install continuous emissions monitors (CEM) and regularly report their actual emissions to the U.S. Environmental Protection Agency (EPA). Extensive regulatory documentation and guidelines have been prepared to assist utilities in complying with the Clean Air Act (e.g., Part 75 (Continuous Emission Monitoring) of the Clean Air Act, and Acid Rain CEMS Program Submission Instructions and Monitoring Plan Forms (U.S. EPA 1995a). The Acid Rain Program regulations require all affected utility units to continuously measure, record and report SO_2, NO_x, volumetric flow data, and CO_2 emissions. To ensure that the continuous emissions monitoring systems and fuel flow meters are performing at an acceptable level and providing quality data, the utility company must submit a monitoring plan and certification test data for acid rain CEM certification. EPA's Acid Rain Division must certify all CEMS and fuel flow meters systems. Finally, the utility must submit quarterly reports.

By capturing compliance data, EPA is able to identify non-complying facilities. If companies violate their emission limits, firms forfeit allowances to cover the excess emissions and pay automatic fines at several times the estimated average cost of compliance. Utilities can demonstrate compliance with decreasing SO_2 emissions limits by purchasing allowances from other utilities, banking extra internally created allowances for future use, switching from high-sulfur coal to low-sulfur coal or natural gas, installing scrubbers, shifting some electricity production from dirtier plants to cleaner ones, and encouraging more efficient electricity use by customers.

The ability to continuously monitor emissions and share these data with regulators makes it easier for utilities to make sure they are complying with the law and for EPA and state regulators to detect noncompliance. In addition, large penalties deter noncompliance.

2.2.3. EPA's Conservation Verification Protocols

The U.S. Environmental Protection Agency (EPA) developed the Conservation Verification Protocols (CVP) as part of its mission to implement the Acid Rain Program authorized by Title IV Of the Clean Air Act Amendments of 1990 (EPA 1995b and 1996; Meier and Solomon 1995; Willems et al. 1993).[1] The CVP has two purposes: (1) to provide a basis for verifying energy savings that would entitle utilities to "bonus" allowances under the Act; and (2) to establish a model that provides guidance to utilities and state regulators in what the EPA believes to be appropriate monitoring and evaluation practice. The CVP provides general guidelines for verifying energy savings rather than specifying the verification procedure for each kind of technology, offering utilities the maximum amount of flexibility (Meier and Solomon 1995). Since no specific measurement technology is required, a utility can use whatever will achieve the verification requirements at the lowest cost.

The CVP strongly encourages metering, customer surveys, and billing data analysis over the simple engineering algorithms that typically form the basis for initial program savings estimates (and that are sometimes accepted by public utility commissions). The CVP is designed to be rigorous without being burdensome on the utility or the regulator.

The CVP allows for two general savings paths to earn credit for conservation programs: Monitored Energy Use, or Stipulated Savings. The Monitored Energy Use Path is the preferred verification approach, and its goal is to measure energy use in such a way as to infer net energy savings, i.e., the savings attributable to the utility conservation program. The Stipulated Savings Path includes procedures for estimating savings, as well as simple equations and standard values for estimating stipulated energy savings from a limited number of conservation measures for which expected energy savings are well understood. This path also includes criteria for developing program-specific engineering estimates that may be used by a utility in limited cases. In some cases, utilities may develop their own engineering estimates. The rationale for the Stipulated Savings approach is that the performance of some measures is well understood and may not be cost-effective to monitor. The list of measures with stipulated savings reduces the monitoring and verification burden and allows utilities to focus on programs where impacts are less predictable.

[1] Title IV of the Clean Air Act sets as a goal the two-phased reduction of SO_X emissions by 10 million tons below 1980 levels. Phase I began in 1995 and affected 100 mostly coal-burning plants in 21 eastern and midwestern states. Phase II, which begins in 2000, tightens emissions on these units and also sets restrictions on smaller, cleaner plants. To help attain the goal of reduced emissions, the Acid Rain Program uses a market-based system of allowances, each of which is the equivalent of 1 ton of SO_X emissions. As part of the Acid Rain Program, Congress also created the Energy Conservation and Renewable Energy Reserve (CRER) — a bonus pool of 300,000 allowances to reward new (as of January 1, 1992) utility initiatives in conservation and renewable energy. The CVPs provide a basis, although not the only one, for allocating the allowances in the CRER.

Finally, the CVP includes guidelines for verifying the persistence of energy savings from conservation measures. There are several options for estimating subsequent-year savings; in every case, however, they rely on the first-year estimate (Meier and Solomon 1995).

2.2.4. Dutch reporting and monitoring guidelines for long term agreements

As part of energy-efficiency policy, long term agreements (LTAs) on energy efficiency have been made for industrial and other sectors since 1992 in the Netherlands (Ministry of Economic Affairs 1997; Nuijen 1997). The LTAs are one of the instruments applied by the Ministry of Economic Affairs to improve energy efficiency beyond existing trends without resorting to new regulations. In these LTAs, business sectors agree to improve the energy efficiency in their primary processes over a range of years, to meet a set goal in the year 2000.

A quantified energy conservation target for the sector as a whole is set in the LTAs, and the means by which the target can be achieved are described in a long-range plan for the entire sector. This allows individual companies within the sector to determine their own targets to achieve the sectoral target. The LTAs are therefore seen as flexible instruments that are able to recognize the diversity of different sectors. The LTAs are signed by the industry association, the Ministry of Economic Affairs, and the supporting energy agency (Novem). Individual companies express their participation by accession letters.

The LTA includes commitments for individual companies, such as the preparation and implementation of energy conservation plans and annual monitoring of energy data. In addition to the energy data, the company provides the following data: (1) information on key parameters affecting energy use (e.g., amount of persons, amount of time building is occupied, number of students in school, etc.); (2) energy-efficiency measures installed; and (3) energy-efficiency measures not yet installed but likely to be taken. The Dutch government energy agency (Novem) collects these data and calculates the Energy Efficiency Index (EEI). The EEI is the ratio of energy used in the year in question and the energy use that would have resulted had the same production been made with the energy efficiency in the year of reference (1989). The numerator and the denominator is the amount of energy used divided by production volume (e.g., tons of bulk product or number of bricks) or size of facility (m^2).

Progress with the LTAs is monitored on an annual basis, and annual reports are prepared. The aim is to realize an average improvement of energy efficiency of 20% in industry, 25-30% in public utilities and 23% in agriculture in comparison with the 1989 level by the year 2000. This relates to energy consumption per physical unit of product.

2.3. Summary

The existing GHG and non-GHG protocols and guidelines contain many provisions that should be useful for the development of MERV guidelines for climate change mitigation projects. In Tables 1 and 2, we highlight the key features of these guidelines as possible models for MERV guidelines. We discuss several of these protocols in more detail in the next three chapters. Most of these existing guidelines refer to other documentation for addressing MERV issues (e.g., sampling, impact analysis of energy savings, etc.) and are flexible in the type and amount of information that is requested from project developers.

Table 1. Key Features of Existing GHG Protocols and Guidelines

Protocol/Guideline	Key Features
USIJI's project proposal guidelines	For project proposal preparation. Comprehensive request for information on GHG and non-GHG impacts, including methodologies, calculations, assumptions, references and key uncertainties. External verification required. Evaluation Panel plays significant role in evaluating project submissions.
SBSTA's uniform reporting format guidelines	For reporting on projects. Based on USIJI guidelines. Requests information on environment, social/cultural, and economic impacts, and on technical difficulties or other obstacles encountered.
WBCSD's project proposal guidelines	For project proposal preparation. Requests information on monitoring, data collection procedures, and external verification. Asks for contingency plan, and discussion of key uncertainties and leakage issues.
World Bank's monitoring & evaluation guidelines	For monitoring and evaluating projects. Provides detailed information for describing institutional impacts and issues. Contains basic framework for addressing methodological issues dealing with monitoring and evaluation.
DOE's voluntary reporting guidelines	For reporting on projects. Offers guidance on recording GHG emissions and GHG reductions. Some guidance on joint reporting and certification. Requests information on direct and indirect emissions .
Winrock's carbon monitoring guidelines	For monitoring projects. Detailed guide to monitoring carbon sequestration, and provides a field-tested system for monitoring net changes in carbon in carbon pools.
SGS Forestry's carbon offset guidelines	For all MERV activities. First international third-party verification service of forestry-based carbon offset projects. Assesses methodologies and verifies emission reduction projections, based on a surveillance program. Requests information on additionality, externalities, and capacity issues. Uses a carbon quantification model.

Table 2. Key Features of Existing Non-GHG Protocols and Guidelines

Protocol/Guideline	Key Features
DOE's energy M&V guidelines	For evaluation of projects. Emphasizes baseline conditions, quality of measure installation, and measured savings. Provides several measurement and verification options for user flexibility.
EPA's acid rain monitoring protocols	For monitoring and reporting on projects. Continuous monitoring of emissions. Penalties for noncompliance.
EPA's conservation and verification protocols	General guidelines for verifying energy savings, allowing for user flexibility. Two general savings paths (monitored and stipulated). Options for estimating persistence of energy savings.
Dutch reporting and monitoring guidelines	For monitoring and reporting. Targets set, but maximizes user flexibility in meeting targets: no prescribed monitoring methodology.